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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,553

04/18/2007

Lynda Jane Brown

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06/10/2010

GE HEALTHCARE, INC.

IP DEPARTMENT 101 CARNEGIE CENTER

PRINCETON, NJ 08540-6231

EXAMINER

SCHLIENTZ, LEAH H

ART UNIT

PAPER NUMBER

1618

MAIL DATE

DELIVERY MODE

06/10/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,553	BROWN ET AL.	
	Examiner	Art Unit	
	Leah Schlientz	1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/12/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

Claims 1-8 are pending and are examined herein on the merits for patentability.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim is drawn to a method for obtaining a diagnostic PET image which comprises the step of "using a radiopharmaceutical kit or cartridge for a radiopharmaceutical kit according to claim 6." The claim provides for the use of a radiopharmaceutical kit or cartridge, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

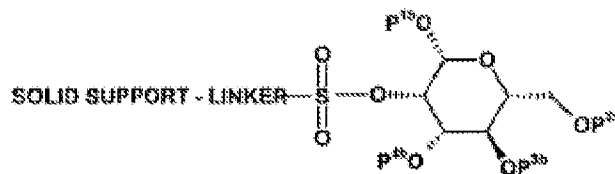
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luthra (WO 03/002157) in view of Holmes (WO 02/055026).

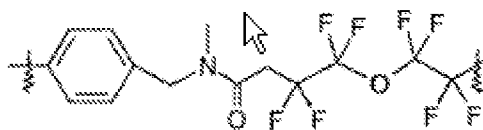
Luthra teaches processes for the production of ^{18}F -labelled tracers to be used as Positron Emission Tomography (PET) radiotracers comprising treatment of a resin-bound precursor of formula:

SOLID SUPPORT-LINKER-SO₂-O-TRACER

with ^{18}F to produce labeled tracers of formula: ^{18}F TRACER, followed by removal of excess ^{18}F by ion exchange chromatography and/or removal of any protecting groups and/or removal of organic solvent and/or formulation of the resultant compound as an aqueous solution (pages 2-3). The process has the benefit of producing ^{18}F labeled tracers quickly and with highly specific activity, yet avoiding time-consuming purification steps. In a further aspect, a process for the production of 2- ^{18}F -fluom-2-deoxy-D-glucose (^{18}F -FDG) which comprises treatment of a solid support-bound precursor of the formula below with ^{18}F (page 7-8).



The SOLID SUPPORT may be any suitable solid-phase support which is insoluble in any solvents to be used in the process. The LINKER may be any suitable organic group which serves to space the reactive site sufficiently from the solid support structure so as to maximize reactivity. Suitably, the LINKER comprises zero to four aryl groups and/or a C₁₋₆ alkyl or C₁₋₆ haloalkyl (suitable fluoroalkyl) and optionally one to four additional functional groups such as amide or sulphonamide groups. Examples of such LINKERS are well known to those of skill in the art of solid-phase chemistry (pages 4-5), but preferably include:



(page 8).

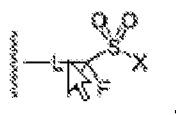
Kits and cartridges are also disclosed (see claims 13, 14).

The linker disclosed by Luthra differs from the instant claims in that variable n of the instant claims is an integer from 2-20, but corresponds to a value of n=1 in the linker disclosed above by Luthra; and also that the nitrogen at the amide bond portion of the linker of the instant claims features a hydrogen atom, but is alkylated in the linker disclosed above by Luthra. It is noted that the phenyl ring on the linker disclosed by Luthra can be considered to be a part of the "solid support" of the instant claims, especially since Luthra exemplifies reaction of structurally similar perfluorobutyl-1,4-

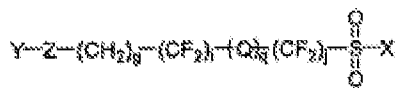
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cyclic –sulfonic anhydride with polystyrene resin (i.e. having a phenyl ring to which the linker is conjugated) (see Example 1, steps iv - viii).

Holmes teaches activated supports and support-bound activators and methods of use in solid phase organic synthesis (abstract). Activated complexes may be treated to afford a radioisotopically labeled compound without significant contamination from undesired compounds for use in PET imaging. For example, support bound targets that can be released from the support upon reaction with radioisotopically labeled nucleophiles are disclosed (pages 49-50). The invention provides an activated support comprising a solid or semi-solid support and at least one support-bound activator having the following formula:



where L is a linking group component, X is a member selected from F, Cl, OH and tri-substituted silyloxy, and wherein the support-bound activator is covalently attached to the solid or semi-solid support (page 29, lines 5+). The linking group can have a variety of structures and is one which provides suitable spacing for the activator portion ($\text{CF}_2\text{-SO}_2\text{-X}$) to interact freely with molecules or reactive components exposed to the activator portion (page 31, lines 16+). In some embodiments, the support-bound activators have the formula:



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in which Y includes NR_1 -support, where R_1 is H or C_{1-8} alkyl; Z includes $\text{C}=\text{O}$, Q is O, X includes F, Cl, OH, and g is an integer selected from 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11; I and j are selected from 1, 2, 3, etc. (page 33, lines 15+). See also page 48, drawn to support-bound activators available in kit form for use in solid phase organic chemistry, and as a reagent for the production of PET-ready molecules (lines 7-11 and 19+). See also Figure 3, page 51. See claims 1-6, 10, 11, 16, 17 and 47-54.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a homologous linker to that disclosed by Luthra, having $n=2-11$ carbon atoms and hydrogen at the amide bond portion of the linker as required by the instant claims, when the disclosure of Luthra is taken in view of Holmes. Specifically, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a hydrogen atom for methyl on the nitrogen atom in the Luthra reference compound LINKER. One would have been motivated to make the substitution because of the close structural relationship of the two compounds and because one of ordinary skill in the art would have reasonably expected that such substitution would produce a linker useful for conjugation to solid support in view of that close structural relationship. A prima facie case of obviousness may be made when chemical compounds have very close structural similarities and similar utilities. "An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound, in the expectation that compounds similar in structure will have similar properties." In re Payne, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 1979). See In re Papesch, 315 F.2d 381, 137 USPQ

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43 (CCPA 1963) and *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1991).

See MPEP 2144.09 I-III. In addition, it would have been obvious to provide n=2-11 carbon atom homologs as compared to the reference compound LINKER disclosed by Luthra. Compounds which are position isomers (compounds having the same radicals in physically different positions on the same nucleus) or homologs (compounds differing regularly by the successive addition of the same chemical group, e.g., by -CH₂- groups) are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). Both Luthra and Holmes are drawn to solid phase organic synthetic methods, including for synthesis of PET tracers. One of ordinary skill could have readily employed a homologous solid-support bound linking group disclosed by Holmes including variables g as an integer from 0-11 and variable R including either H or C₁₋₈ alkyl as analogous to the LINKER in Luthra, especially since Luthra teaches that the LINKER may be any suitable organic group which serves to space the reactive site sufficiently from the solid support structure so as to maximize reactivity. One of ordinary skill would have recognized that methyl, ethyl, propyl, butyl, etc. homologs would maintain the functional properties of the LINKER disclosed by Luthra with the expectation that compounds similar in structure will have similar properties.

Conclusion

No claims are allowed at this time.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leah Schlientz whose telephone number is (571)272-9928. The examiner can normally be reached on Monday-Tuesday and Thursday-Friday 9 AM-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Hartley can be reached on 571-272-0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael G. Hartley/
Supervisory Patent Examiner, Art Unit 1618

LHS